Case Report

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Successful Control of Massive Vaginal Bleeding With Resuscitative Endovascular Balloon Occlusion of the Aorta and Pelvic Packing

Yunus E Özlüer MD, Çağaç Yetiş MD, Evrim Sayın MD and Mücahit Avcil MD

Department of Emergency Medicine, Adnan Menderes University Hospital, Aydın, Turkey

Gynecological malignancies may present as life-threatening vaginal bleeding. Pelvic packing and resuscitative endovascular balloon occlusion of the aorta (REBOA) may be useful along with conventional vaginal packing in terms of hemorrhage control. Emergency physicians should be able to perform these interventions promptly in order to save patients from exsanguination.

Keywords: *REBOA; pelvic packing; emergency department; vaginal bleeding; cervical cancer*

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CASE REPORT

A 41-year-old female with a known history of inoperable cervical malignancy presented with massive vaginal bleeding for one hour prior to her presentation to the ER. Initial vital signs upon her presentation were as follows, blood pressure of 60/40 mmHg, heart rate of 120 beats per minute and SpO2 of 99 in room air representing a Class III hemorrhagic shock with an estimated 30–40% loss of circulating blood volume [1]. She was fully alert with a Glasgow Coma Scale of 15. Her physical examination was normal except a diffuse tenderness of the abdomen with palpation. She was on low molecule weight heparin therapy due to recently diagnosed deep vein thrombosis in her right leg.

Initial laboratory workup revealed a lactic acidosis with a lactate level of 5.1 mmol/L and pH of 7.27, complete blood count of hemoglobin of 5.3 gr/dL, hematocrit of 16.7%, mean corpuscular volume of 90.3 fL and a platelet count of 427 × 10^3/μL. Coagulation tests included: international normalized ratio (INR) of 1.07, prothrombin time of 13.3 seconds (normal values: 10–14 seconds), and activated partial thromboplastin time of 43.5 seconds (normal values 22.8–31 seconds).

The patient was considered to be in Class III hemorrhagic shock and prompt resuscitation with two packs of red blood cells without a cross-match was initiated in the ER and maintained through the ICU admission process. A vaginal pack soaked in Monsel's solution (ferric sulfate) was applied to the cervix. An intravenous infusion of tranexamic acid (1 g in 8 hours) was also initiated following an intravenous bolus dose of 1 g. Despite these resuscitative measures and blood transfusions, the hemoglobin and hematocrit levels increased only to 6.7 gr/dL and 16.7%, respectively. Also, the hypotension and the vaginal bleeding persisted. We then decided to place a zone III intermittent resuscitative endovascular balloon occlusion of the aorta (iREBOA) with a 7 Fr Edwards Fogarty® occlusion catheter (Edwards Lifesciences, Irvine, CA, USA) through a 7 Fr sheath introducer (Shunmei Medical Co., Ltd., Guangdong, China), which was placed under ultrasound guidance in the patient's left common femoral artery. The occlusion catheter balloon was deflated for 15 minutes every 2 hours to perform hemorrhage control and avoid possible reperfusion injury. Total iREBOA time including the duration of the

Corresponding author:
Yunus Emre Özlüer MD, Department of Emergency Medicine, Adnan Menderes University Hospital, Aytepe Mevkii, 09100, Aydın, Turkey.
Email: yeozluer@adu.edu.tr

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Table 1 Changes in vitals and the laboratory profile after each intervention.

	Admission	*Two packs of O Rh (-) RBCs*	*iREBOA*	*iREBOA+PPP*	*PPP Alone*	*After Unpacking*
			4:4:4 Packs of RBC:FFP:Plt			
BP (mmHg)	61/52	93/66	125/66	140/90	110/80	110/70
Pulse/min	136	83	116	90	90	105
Hb (g/dL)	5.3	6.7	8.7	10.1	10.0	9.1
Htc (%)	16.7	21.3	26.1	29.9	29.3	27.2
Plt (10^3/μL)	427	275	80	95	131	124
INR	1.07	1.36	0.80	0.99	0.79	0.89
PT	13.3	17.2	10.9	13.1	10.7	12
APTT	43.5	48.7	25.1	28.3	20.3	27.6

BP, blood pressure; Hb, hemoglobin; Htc, hematocrit; Plt, platelets; INR, international normalized ratio; PT, prothrombin time; APTT, activated partial thromboplastin time.

deflation was 20 hours Although the bleeding was slowed with iREBOA, hemorrhage persisted as continuous oozing, so we decided to perform preperitoneal pelvic packing in combination with the balloon occlusion via a midline suprapubic vertical incision. Three packs were placed in each lower abdominal quadrant and hemorrhage control was achieved. iREBOA was then stopped on the next day and the patient was unpacked on the third day. During iREBOA and packing the patient received four packs of RBCs with a cross-match, four units of fresh frozen plasma and four units of platelets (Table 1). The patient was discharged on the 7th day of her ICU admission with a Modified Rankin Scale of 0.

DISCUSSION

One of the main indications for REBOA is the management of bleeding originating from non-compressible regions of the body such as the pelvis. According to the literature, REBOA seems an effective method for the management of postpartum major vaginal bleeding [2]. However, we did not come across a publication that considered the use of REBOA for major bleeding from cervical cancer.

Vaginal bleeding is a common symptom and may vary from low-grade oozing to life-threatening bleeds especially in advanced cervical cancer [3]. Local measures such as vaginal packs soaked with Moh's paste or Monsel's solution are recommended in the literature [4]. However, these measures were not able to control the bleeding in our patient. Thus, we need more advanced interventions, which we are able to perform in an emergency setting. Preperitoneal pelvic packing is primarily considered in hemodynamically unstable patients with a pelvic fracture who require a transfusion of more than two units of blood products [5]. In our patient, we sought to increase the intrapelvic pressure by packing to restrict the blood supply of the cervix. With all these interventions we achieved bleeding control in several ways: transvaginal, pelvic, and intraaortic. This led us to believe that in patients with uncontrolled hemorrhage, from a cervical malignancy, pelvic packing may be considered at an early stage of the hemorrhage as an adjunct to REBOA to achieve bleeding control.

Pelvic packing and REBOA are quick, simple and effective interventions which can be performed by emergency physicians to save their patients from exsanguination. Our patient had a Stage IVB cervical malignancy which was considered incurable with a median duration of survival under one year [6]. She had had several sessions of chemotherapy combined with radiotherapy but the efforts to cure the disease had been terminated for 6 months. With our intervention, the patient was discharged without any neurologic sequelae and we were informed via a phone call with the patient's relatives that the patient lived for 3 months after the discharge and that she was ambulatory until one month before she died. We believe that this short period of time may be important for the patient considering the situation she was in. Above all, we also suggest that even with an incurable health condition, such as end-stage malignancies, a patient should not bleed to death.

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